

## **SPECIFICATIONS FOR AERIAL PHOTOGRAPHIC PRODUCTS**

This is a reference guide for aerial photography consultants providing aerial photography and related products use by the Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA), Lakewood, Colorado.

### **GENERAL DESCRIPTION**

#### **A. AERIAL PHOTOGRAPHY**

- 1) Full stereoscopic coverage shall be obtained on each flight line, for its entire length. Forward overlap shall average 60 percent at the mean terrain elevation of each flight strip, unless otherwise indicated on the flight data sheet provided. In no case shall the overlap be less than 55 percent. Ground control shall be established in advance of the photography date.
- 2) The flights shall be made at a height that shall produce photography at an average scale as listed in the Scope of Work (SOW). The photography shall be obtained using a precision aerial mapping camera having a focal length of approximately 6 inches with a 9 inch by 9 inch negative format. The photography obtained must be suitable for mapping and digitizing with a second order, optical train stereo plotter as well as a Photogrammetric Work Station (softcopy).
- 3) The suitability of the camera(s) shall be determinable from the test report (calibration data) which shall be furnished to the Government by the consultant for the project work. Such report(s) shall be based on adequate tests and measurements made by an approved aerial camera testing authority. The report(s) shall have been performed within 36 months prior to the date of the photo mission.
- 4) Breaks in flight strips shall not be permitted. Any photographs crabbed or tilted in excess of 5 degrees may be cause for rejection of that particular flight strip. Any flight strip deviating from the plotted flight line, that results in insufficient lateral ground coverage, may also be rejected.
- 5) There shall be no apparent blurring of the imagery due to ground motion on the aerial negative when magnified up to 6 diameters. A combination of aircraft speed, camera shutter speed, lens f-stop and high quality photographic aerial film shall be used to produce negatives suitable for precise analytical triangulation, stereo compilation and digital data acquisition.
- 6) The negatives shall be free from deep shadows. To insure this, photography shall not be collected when the sun is less than 30° above the horizon unless specific prior permission is obtained from the Government. The aerial negatives shall be free of clouds, shadows, smoke, haze, snow or other deficiencies, which would interfere with their intended use.

- 7) The developed negative roll shall become the property of the Government; placed on a standard aerial film spool in a sturdy metal or plastic canister. The provided film can label shall be completed by the contractor, listing all flight lines and exposures contained on the film.
- 8) The processed negatives shall be stamped or hand lettered from left to right along the edge of overlap on each exposure, with the following information; date, photo scale, project code name and flight line exposure number. The project code name shall be three groups of characters separated by dashes, beginning with "R8". The third and fourth characters represent the year, as in 05 for 2005. The fifth and sixth characters represent the state the project lies in, as in CO for Colorado. The seventh, eighth and ninth characters shall designate the film roll number is determined by the CFLHD Project Manager. The code "R8-05CO-542" would indicate a 2005 project in Colorado on the five hundred forty second roll of film in the CFLHD Film Archives. The project code name need only appear on the first and last exposures of the flight line. Exposure numbering shall increase as indicated by the direction of the arrows on the flight line maps. Generally, this shall be toward the north and/or west. Each strip shall begin with exposure number one. (This is not meant to dictate direction the airplane is to be flown on the mission.)

## **B. PHOTOGRAPHIC PRINTS**

- 1) The contractor shall furnish contact prints from the aerial negatives. The black and white prints shall be made emulsion to emulsion, on medium weight, matte R.C. paper. One set of the black and white prints shall be annotated with field control and the remaining set used to prepare the photographic index. When a digital index is prepared the second set of black and white contacts shall be included in final delivery. Color prints shall also be made on a medium weight, matte R.C. paper. They shall be trimmed with a margin of 1/8 inch outside the photographic image. The tonal quality or color shall be of good quality, allowing correct interpretation of the ground control.
- 2) The contractor shall furnish a digital file containing copies for each of the original images in TIF format and scanned on a mapping-grade optical scanner in color and at 12.5 $\mu$  resolution. Where possible, this imagery shall be scanned from the original negative.

## **C. INDEX OF AERIAL PHOTOGRAPHY**

- 1) The contractor shall prepare a photographic index by connecting one set of the black and white contact prints. The photographs shall be overlap matched by corresponding images along the flight line.
- 2) The flight line and exposure number of each photograph shall show clearly. Numbers unavoidably obscured shall be indicated by "stick up" tabs.
- 3) The assembly shall be photocopied at 2X scale or a scale which fits on a 24" by 36" sheet. The index shall include title information identifying the project, name of the contractor furnishing the photography, name of the contracting authority (Federal Highway Administration), photo scale, index scale, camera calibrated focal length, flight height, date of photography, north arrow and a graphic bar scale.

- 4) The contractor shall provide the original index negative and 2 sets of black and white contact prints of the index on medium weight, R.C. type paper.
- 5) A digital index may be substituted for the photographic index if approved by CFLHD. When a digital index is to be delivered, it shall be in TIFF format with flight line and exposure numbers indicated on the appropriate exposure. Two hard copy plots of the digital index shall be delivered.